IN THE CLAIMS

In this amendment, claims 1-31 and 64-85 are pending. Claims 1, 3, 5, 6, 9, 10, 12, 13, 15, 24, 27, 31, and 85 are amended. Claims 64-74 are canceled without prejudice or disclaimer toward pursuit of these claims in a divisional application. The status of all claims is provided below.

1. (currently amended) A process of making a device for conducting a unit operation ~~operations on a fluid~~ comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path extends in a direction substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels parallel to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs parallel to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three adjacent shims through which the flow path is formed and wherein a straight, unobstructed line is present through the flow path in said at least three shims;

wherein the three shims are configured such that a unit operation can be performed on a fluid in the flow path in which the straight, unobstructed line is present in said at least three adjacent shims; and

bonding the shims to form ~~a~~ the device capable of performing

~~a~~ the unit operation on a fluid.

2. (previously presented) The process of claim 1 wherein the flow path is formed by an aperture in each of the at least three adjacent shims and wherein the aperture in each of the at least three adjacent shims comprises a shape selected from the group consisting of: circles, triangles, waves, ovals, irregular shapes and rectangles or squares or triangles with rounded corners.

3. (currently amended) The process of claim 2 ~~wherein the flow path is formed by an aperture in each of the at least three adjacent shims and~~ wherein the aperture in each of the at least three adjacent shims comprises a shape selected from the group consisting of: circles and triangles; and

wherein the at least three shims are bonded to form ~~a~~ the device wherein the device comprises ~~comprising~~ a flow path having a cylindrical or prismatic shape.

4. (original) The process of claim 1 wherein each of the at least 3 adjacent shims is identical.

5. (currently amended) A process of making a device for conducting a unit operation comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path extends in a direction substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels parallel to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and

again runs parallel to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three adjacent shims through which the flow path is formed and wherein a straight, unobstructed line is present through the flow path in said at least three shims;

wherein the three shims are configured such that a unit operation can be performed on a fluid in the flow path in which the straight, unobstructed line is present in said at least three adjacent shims; and

bonding the shims to form the device capable of performing the unit operation on a fluid; and

~~The process of claim 1~~ further comprising the step of placing a catalyst or sorbent in said flow path.

6. (Currently amended) The process of claim 1 wherein the flow path in said at least three shims does not connect ~~mix~~ with any other flow paths.

7. (previously presented) The process of claim 1 further comprising the step of placing a static mixer in said flow path.

8. (original) A device formed by the method of claim 1.

9. (Currently amended) A process of conducting ~~a~~ the unit operation comprising the step of passing a fluid through the flow path formed in said at least three adjacent shims of the device of claim 8 and conducting the unit operation on the fluid in the flow path formed in said at least three adjacent shims.

10. (Currently amended) A process~~ of making a device from a plurality of shims, passing a fluid through said device and conducting a unit operation on the fluid~~, comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path is substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels parallel to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs parallel to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three shims through which the flow path is formed and wherein a straight, unobstructed line is present through the flow path in said at least three shims;

wherein the flow path in said at least three shims does not mix with any other flow paths;

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing a fluid into the device such that a fluid passes through the flow path in said at least three shims; and

performing at least one unit operation on the fluid as it passes through the flow path in which a straight, unobstructed line is present in said at least three shims.

11. (previously presented) The process of claim 10 wherein the flow path formed in said at least 3 shims is defined by borders of apertures in said at least 3 shims, and wherein, in each of said at least 3 shims there is a border of said borders of apertures in said at least 3 shims defining the flow path, the border having a circumference and wherein said circumference in each shim is at least 20% populated by edge features.

12. (Currently amended) The process of claim 10 wherein the flow path formed in said at least 3 shims is defined by ~~the~~ borders of apertures in said at least 3 shims, and wherein, in at least one of said at least 3 shims there is a border of said borders of apertures in said at least 3 shims defining ~~a~~ the flow path, the border having a circumference and wherein said circumference in each shim is at least 20% populated by edge features, and wherein in another of said at least 3 shims there is a border defining the flow path, and the border in said another of said at least 3 shims is smooth.

13. (Currently amended) A process ~~of conducting a unit operation on a fluid~~, comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path is substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels parallel to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs parallel to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three shims through which the flow path is formed and a straight, unobstructed line is present through the flow path in said at least three shims;

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing the ~~a~~ fluid into the device such that the fluid

passes through the flow path in said at least three shims; and

performing ~~at least one~~ the unit operation on the fluid as it passes through the flow path in which the straight, unobstructed line is present in said at least three shims.

14. (original) The process of claim 13 wherein the device is capable of performing at least one unit operation selected from the group consisting of: vaporization, compression, chemical separation, distillation, reaction and condensation.

15. (Currently amended) The process of claim 13 wherein the flow path in said at least three shims does not ~~mix~~ connect with any other flow paths.

16. (original) The process of claim 13 wherein said fluid comprises at least a portion of a reaction composition; and

further comprising a second fluid that passes through a second flow path in said at least three shims.

17. (original) The process of claim 16 wherein the fluid in said flow path and the second fluid in said second flow path do not mix.

18. (original) The process of claim 17 wherein the fluid in said flow path and the second fluid in said second flow path in said at least three shims are separated by a distance of 5 mm or less and wherein the pressure in said flow path and the second flow path differ by at least 1 atm.

19. (original) The process of claim 18 wherein the pressure in said flow path and the second flow path differ by at least 10 atm.

20. (original) The process of claim 18 wherein the fluid in said flow path and the second fluid in said second flow path in said at least three shims are separated by a distance of 1 mm or less and wherein the pressure in said flow path and the second flow path differ by at least 19 atm.

21. (original) The process of claim 17 wherein the fluid in the second flow path is a heat exchange fluid.

22. (original) The process of claim 18 wherein the flow path comprises first supports that extend across the flow path, and the second flow path comprises second supports that extend across the second flow path; and

wherein the first supports and the second supports are staggered.

23. (original) The process of claim 17 wherein the second fluid comprises a second reaction composition;

wherein the reaction composition reacts exothermically; and

wherein the second reaction composition reacts endothermically.

24. (Currently amended) A process ~~of conducting a unit operation on a fluid~~, comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path is substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to shim width, and furthermore, a flow path that travels parallel to shim thickness over the surface of a shim, through an opening in

an adjacent shim, and down to the surface of another shim and again runs parallel to shim thickness is not "substantially parallel to shim thickness";

wherein the plurality of shims comprises at least three shims through which the flow path is formed and wherein the flow path in said at least three shims has a minimum dimension (height or width) of at least 10 •m;

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing the ~~a~~ fluid into the device such that the fluid passes through the flow path in said at least three shims; and

performing ~~at least one~~ the unit operation on the fluid as it passes through the flow path in which the straight, unobstructed line is present in said at least three shims.

25. (original) The process of claim 24 wherein the unit operation is selected from the group consisting of: chemical reaction, vaporization, compression, chemical separation, distillation, condensation, heating, and cooling.

26. (original) The process of claim 24 wherein the flow path has a maximum dimension (height or width) of at most 5000 •m.

27. (Currently amended) A process ~~of making a device from a plurality of shims, passing a fluid through said device and conducting a unit operation on the fluid~~, comprising:

stacking a plurality of shims such that a continuous flow path is formed through the shims;

wherein the flow path is substantially parallel to shim thickness;

wherein the term "substantially parallel to shim thickness" means substantially perpendicular to shim width and permits some curvature or minor, or partial deviation from 90° with respect to

shim width, and furthermore, a flow path that travels parallel to shim thickness over the surface of a shim, through an opening in an adjacent shim, and down to the surface of another shim and again runs parallel to shim thickness is not "substantially parallel to shim thickness";

bonding the shims to form a device capable of performing a unit operation on a fluid;

passing a fluid into the device such that the fluid passes through the flow path in said plurality of shims; and

performing at least one unit operation on the fluid as it passes through the flow path in said plurality of shims;

wherein the unit operation is selected from the group consisting of distilling, reacting, adsorbing, heating, cooling, compressing, expanding, separating, absorbing, vaporizing, condensing, and combinations of these.

28. (previously presented) The process of claim 27 wherein the plurality of shims comprises at least three shims through which the flow path is formed and wherein a straight line can be drawn through the flow path in said at least three shims.

29. (original) The process of claim 28 wherein the device is capable of at least two different unit operations.

30. (original) The process of 29 wherein there is a second flow path adjacent to said flow path and wherein a heat transfer fluid flows through said second flow path.

31. (Currently amended) The process of claim 29 wherein the at least two different unit operations comprise heating and reacting, and further wherein said heating comprises combustion occurring in said flow path and said reacting comprises a steam reforming reaction occurring in the second flow path.

32-63. (canceled).

64-74. (canceled)

75. (previously presented) The process of claim 1 wherein the flow path is formed by an aperture in each of the at least three adjacent shims and wherein the aperture in each of the at least three adjacent shims comprises a shape selected from the group consisting of: waves and irregular shapes.

76. (previously presented) The process of claim 13 wherein the device is capable of performing at least one unit operation selected from the group consisting of: compression, chemical separation, distillation, and condensation.

77. (previously presented) The process of claim 24 wherein the unit operation is selected from the group consisting of: vaporization, compression, chemical separation, distillation, and condensation.

78. (previously presented) The process of claim 1 wherein the flow path is formed by an aperture in each of the at least three adjacent shims and wherein the aperture in each of the at least three adjacent shims comprises rectangles or squares or triangles with rounded corners.

79. (previously presented) The process of claim 7 wherein the mixer comprises a structure comprising a helical pattern, double helical pattern, spiral pattern, or alternating spiral pattern.

80. (previously presented) The process of claim 28 wherein

there is a second flow path adjacent to said flow path and wherein each of the flow path and the second flow path contain a catalyst and wherein the catalyst in the second catalyst is different from the catalyst in said flow path.

81. (previously presented) The process of claim 80 wherein an exothermic reaction is conducted in said flow and an endothermic reaction is conducted in the second flow path.

82. (previously presented) The process of claim 27 wherein the flow path comprises a metal film.

83. (previously presented) The process of claim 28 wherein the flow path comprises a metal film.

84. (previously presented) The process of claim 28 wherein the flow path comprises a catalyst metal on an oxide support.

85. (Currently amended) The process of claim 13 wherein the plurality of shims comprises at least five shims through which the flow path is formed and a straight, unobstructed line is present through the flow path in said at least five shims; and comprising

passing ~~a~~ the fluid into the device such that the fluid passes through the flow path in said at least five shims; and

performing at least one unit operation on the fluid as it passes through the flow path in said at least five shims.